

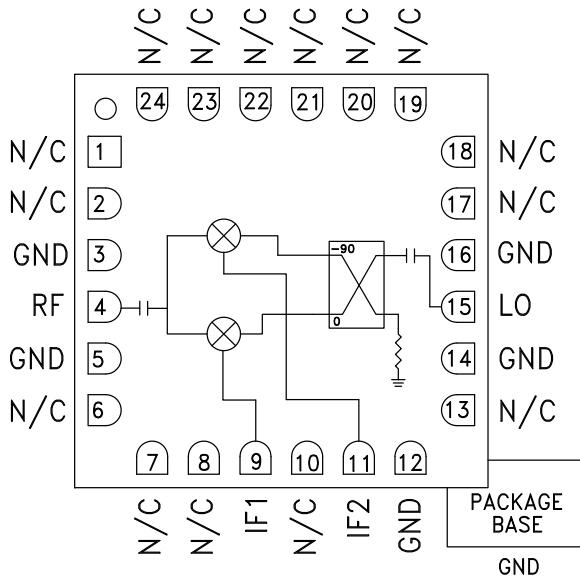

**GaAs MMIC I/Q MIXER  
8.5 - 13.5 GHz**

### Typical Applications

The HMC527LC4 is ideal for:

- Point-to-Point Radios
- Point-to-Multi-Point Radios & VSAT
- Test Equipment & Sensors
- Military End-Use

### Functional Diagram



### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $\text{IF} = 100 \text{ MHz}$ , $\text{LO} = +19 \text{ dBm}^*$

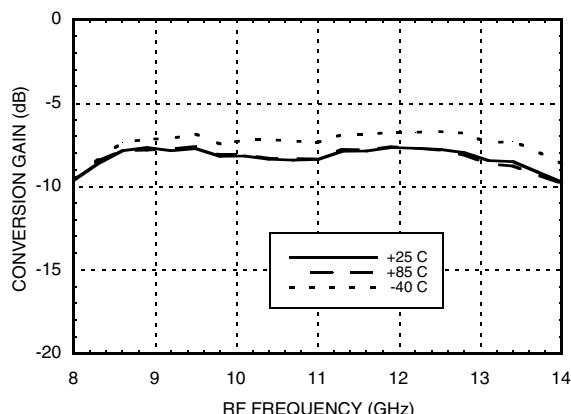
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, RF/LO	8.5 - 13.5			10.5 - 12			GHz
Frequency Range, IF	DC - 2			DC - 2			GHz
Conversion Loss (As IRM)		8	10		7.5	9.5	dB
Image Rejection	17	25		27	34		dB
1 dB Compression (Input)		+21			+21		dBm
LO to RF Isolation	37	45		37	45		dB
LO to IF Isolation	17	22		18	24		dB
IP3 (Input)		+25			+28		dBm
Amplitude Balance		0.6			0.4		dB
Phase Balance		6			6		Deg

\* Unless otherwise noted, all measurements performed as downconverter.

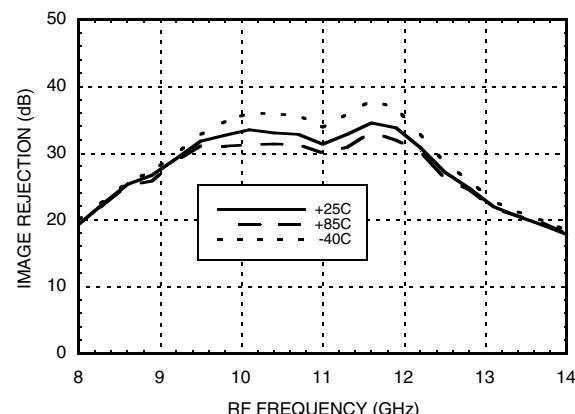


**Data taken as IRM with External IF Hybrid**

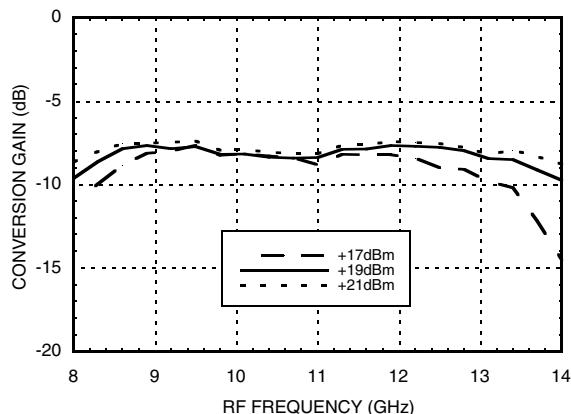
### Conversion Gain vs. Temperature



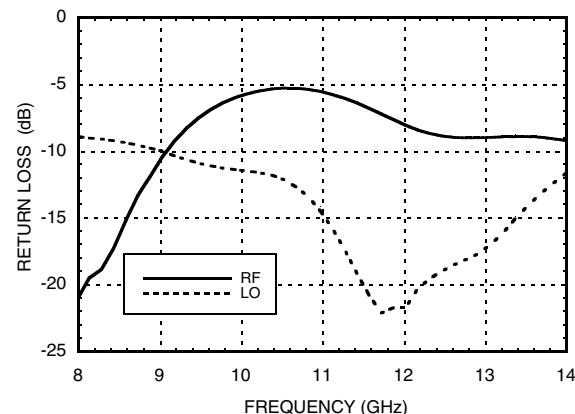
### Image Rejection vs. Temperature



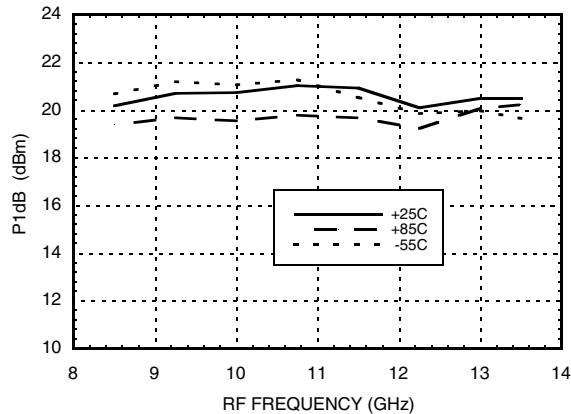
### Conversion Gain vs. LO Drive



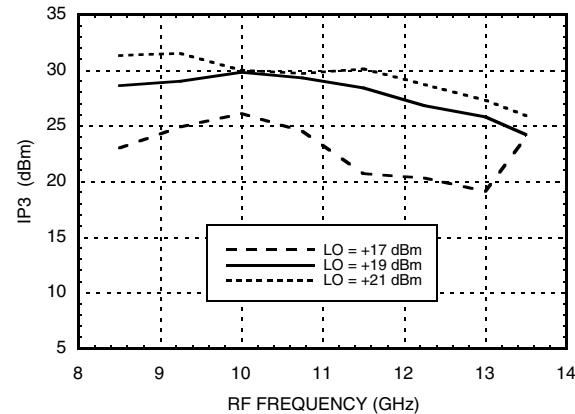
### Return Loss

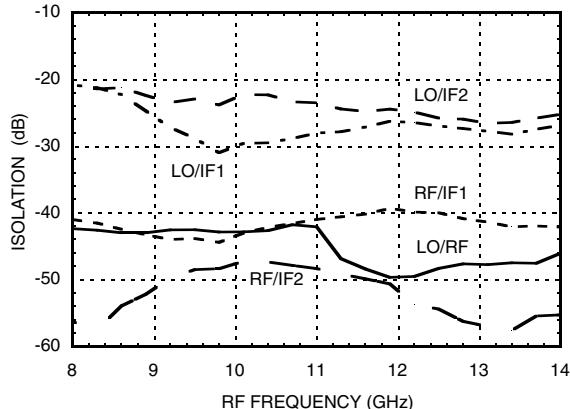
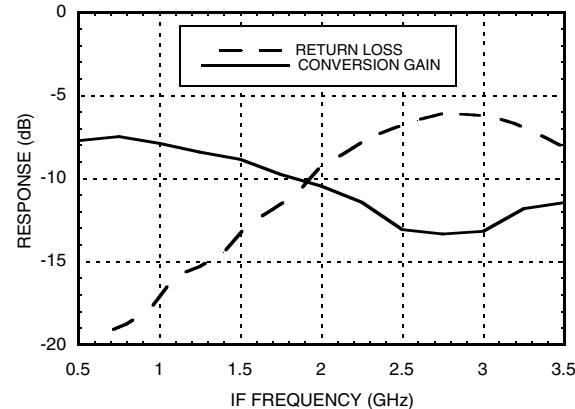
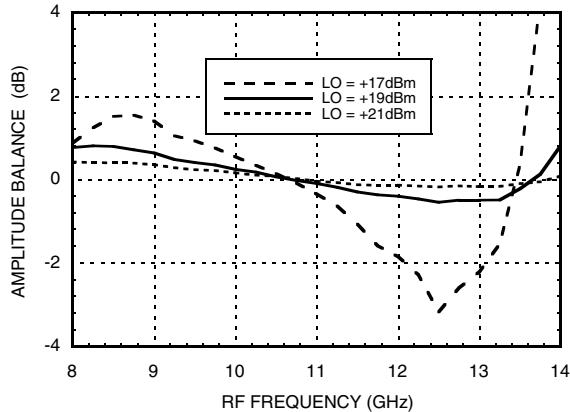
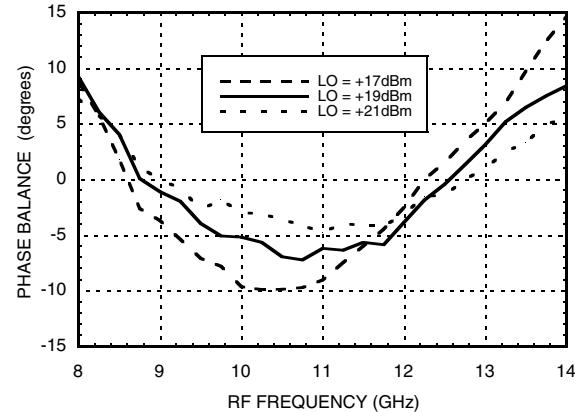
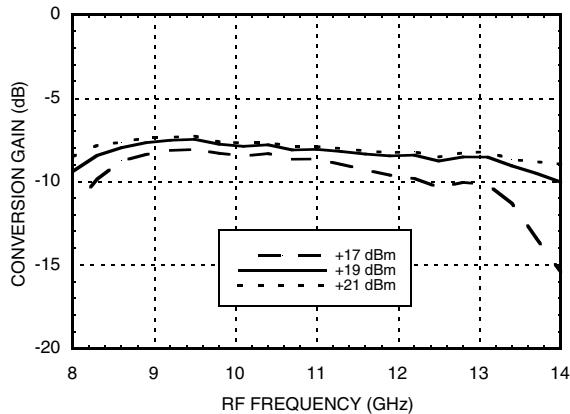
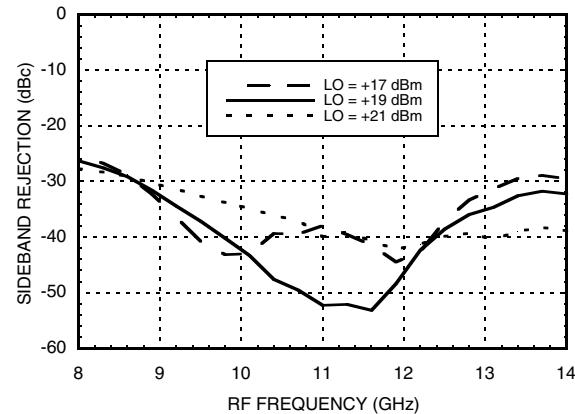


### Input P1dB vs. Temperature



### Input IP3 vs. LO Drive




**GaAs MMIC I/Q MIXER**  
**8.5 - 13.5 GHz**
**Quadrature Channel Data Taken Without IF Hybrid**
**Isolations**

**IF Bandwidth\***

**Amplitude Balance vs. LO Drive**

**Phase Balance vs. LO Drive**

**Upconverter Performance Conversion Gain vs. LO Drive\***

**Upconverter Performance Sideband Rejection vs. LO Drive\***


\* Conversion gain data taken with external IF hybrid

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106 Phone: 781-329-4700 • Order online at [www.analog.com](http://www.analog.com) Application Support: Phone: 1-800-ANALOG-D


**GaAs MMIC I/Q MIXER  
8.5 - 13.5 GHz**
**Harmonics of LO**

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
8.5	43	48	50	77
9.5	48	47	57	64
10.5	53	51	62	53
11.5	50	57	67	45
12.5	48	52	67	47
13.5	44	51	64	xx

LO = +19 dBm

Values in dBc below input LO level measured at RF Port.

**MxN Spurious Outputs**

mRF	nLO				
	0	1	2	3	4
0	xx	-11	16	22	38
1	33	0	53	62	95
2	86	77	76	78	94
3	96	95	101	91	102
4	89	94	96	101	107

RF = 10.6 GHz @ -10 dBm  
 LO = 10.5 GHz @ +19 dBm  
 Data taken without IF hybrid  
 All values in dBc below IF power level

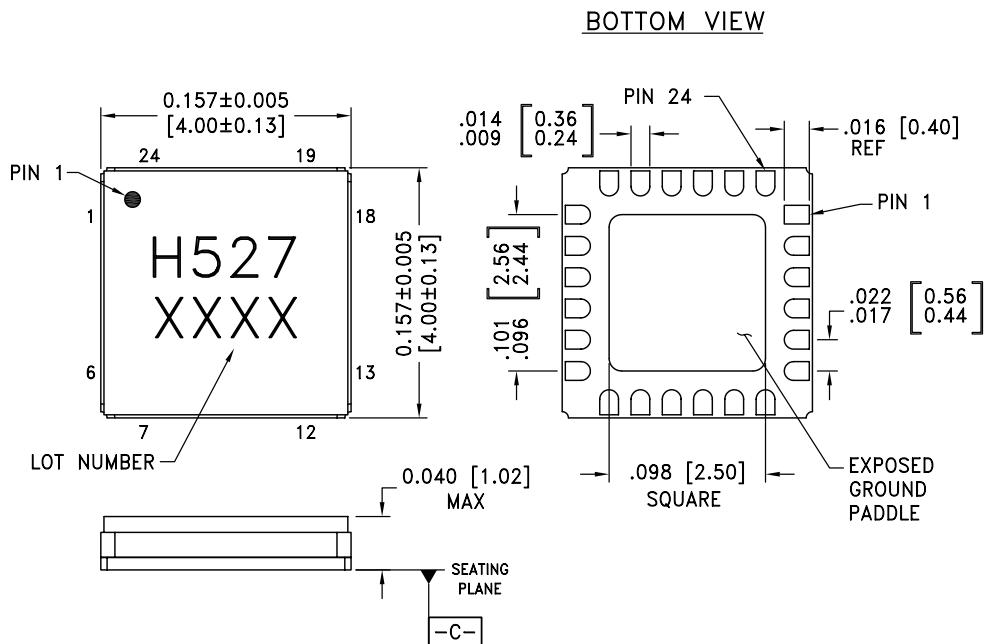
**Absolute Maximum Ratings**

RF / IF Input	+20 dBm
LO Drive	+27 dBm
Channel Temperature	150°C
Continuous Pdiss (T=85°C) (derate 7.1 mW/°C above 85°C)	460 mW
Thermal Resistance ( $R_{TH}$ ) (junction to die bottom)	140 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C


**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**



### Outline Drawing


**NOTES:**

1. PACKAGE BODY MATERIAL: ALUMINA
2. LEAD AND GROUND PADDLE PLATING: 30 - 80 MICROINCHES GOLD OVER 50 MICROINCHES MINIMUM NICKLE
3. DIMENSIONS ARE IN INCHES [MILLIMETERS]
4. LEAD SPACING TOLERANCE IS NON-CUMULATIVE
5. PACKAGE WARP SHALL NOT EXCEED 0.05mm DATUM
6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND

### Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[2]</sup>
HMC527LC4	Alumina, White	Gold over Nickel	MSL3 <sup>[1]</sup>	H527 XXXX

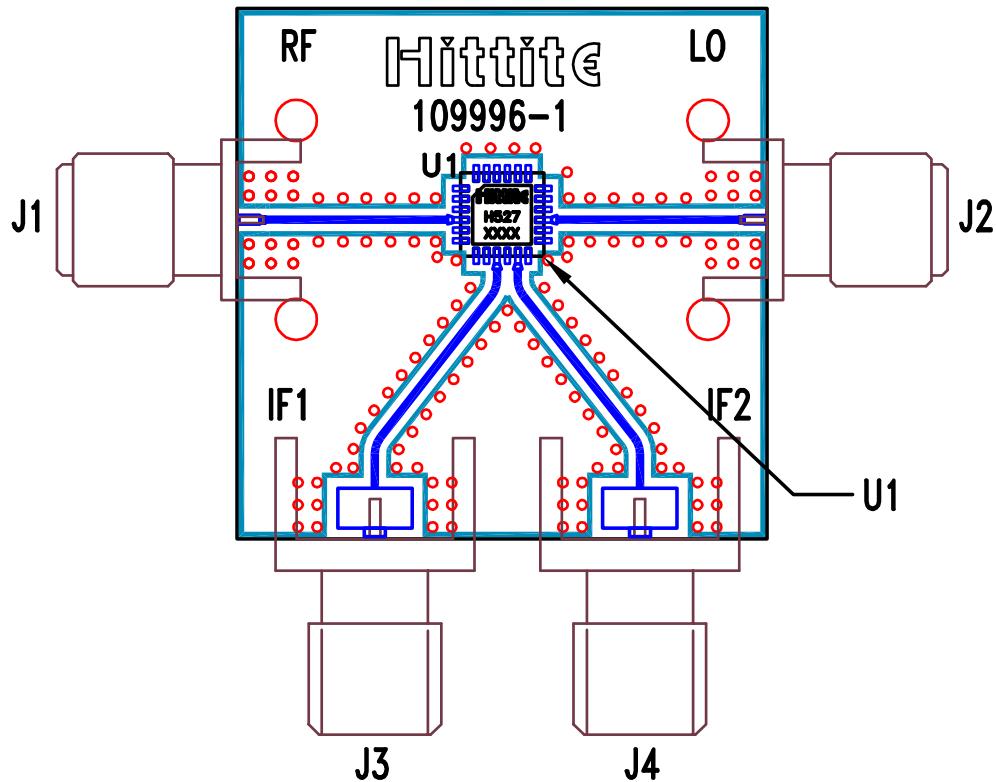
[1] Max peak reflow temperature of 260 °C

[2] 4-Digit lot number XXXX



### Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2, 6 - 8, 10, 13, 17 - 24	N/C	No connection required. These pins may be connected to RF/DC ground without affecting performance.	
3, 5, 12, 14, 16	GND	These pins and package bottom must be connected to RF/DC ground.	
4	RF	This pin is AC coupled and matched to 50 Ohms from 8.5 to 13.5 GHz.	
9	IF1	This pin is DC coupled. For applications not requiring operation to DC, this port should be DC blocked externally using a series capacitor whose value has been chosen to pass the necessary IF frequency range. For operation to DC, this pin must not source/sink more than 3mA of current or part non-function and possible part failure will result.	
11	IF2		
15	LO	This pin is AC coupled and matched to 50 Ohms from 8.5 to 13.5 GHz.	

**Evaluation PCB****List of Materials for Evaluation PCB 109998 [1]**

Item	Description
J1, J2	PCB Mount K RF Connector, SRI
J3 - J4	PCB Mount SMA Connector, Johnson
U1	HMC527LC4
PCB [2]	109996 Evaluation Board

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request.

**GaAs MMIC I/Q MIXER  
8.5 - 13.5 GHz**

MIXERS - I/Q, IRMS &amp; RECEIVERS - SMT

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Analog Devices Inc.:](#)

[109998-HMC527LC4](#)